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Science News-Letter

The Weekly Summary of Current Science

A Science Service Publication

Edited by Watson Davis
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December 25, 1926

GENERAL SCIENCE

A.A.A.S. Meeting

The 83d meeting of the American Associaton for the Advancement of Science will be held in Philadelphia December 27 to January 1. The highlights of this important meeting, at which some 2,000 scientific papers will be read, will be given in the next issue. A special edition of the SCIENCE NEWS-LETTER will be distributed at the A.A.A.S. meeting.

Thirty-nine affiliated organizations will join with the sixteen sections of the A.A.A.S. in meeting during Christmas week. It is estimated at over two million words will be spoken during the various sessions.

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MICHAEL IDVORSKY PUPIN

Prof. Pupin is retiring president of the American Association for the Advancement of Science; his address will be the principal address at the Philadelphia meeting. Dr. Pupin holds the position of Professor of Electro-Mechanics at Columbia University

CHEMISTRY—PHYSICS

Making and Unmaking Matter

By EDWIN E. SLOSSON

The greatest scientific achievement of the nineteenth century, in the opinion of those who lived in that century, was the formulation of two fundamental physical laws of the universe, the conservation of mass and the conservation of energy. According to these matter and energy were immutable in amount and neither could ever be created or destroyed in the minutest measure.

But the twentieth is an unsettling century. Such mental revolutionists as Einstein, Planck and Bohr have opened our eyes and widened our outlook. We cannot be so cocksure about many ideas as were the simple-minded scientists of the former century. Some of the generalizations which seemed to them absolute and universal principles of nature appear to the more critical eyesight of the present generation to be disguised definitions; similar, as Eddington puts it, to the Great Law to which there is no exception, that there are three feet in every yard.

For instance, the law of the conservation of energy. We see a lump of burning coal giving off energy at a great rate as radiant heat and light. Where did that energy come from? Where was it when the lump was cold, if no energy can be created in the course of combustion? The reply of the nineteenth century chemist was clear and decided. The energy was there all the time in exactly the same amount, although its presence could not be demonstrated because it was in the form of "potential energy." Obviously this was unanswerable as an argument, although not very enlightening as an explanation. We are nowadays disposed to suspect that this "potential energy" was put into the coal by logic rather than by geology, and that if it exists in nature at all it is in the nature of the human mind. The twin laws of conservation of matter and energy are as useful as ever, for they still serve to clarify our conceptions and to guide our experimentations. No experiment has ever been able to detect the slightest flaw in them, and it may never be possible to devise tests so delicate as to disclose any discrepancy. Yet neith-

(*Just turn the page*)

LIBERTY HYDE BAILEY

Dr. Bailey is president of the American Association for the Advancement of Science, and will officiate at the Philadelphia sessions. He has for many years been this country's leading author, editor and publisher on horticulture and related subjects, as well as a keen systematic botanist.

Unmaking Matter

(*Continued from Page* 193)

er law is now regarded as absolute in itself and it seems that we shall have to substitute a general law which will include the two and allow for the transformation of matter into energy and *vice versa*. Einstein has worked out the formula for the equivalence of matter and energy, so we can now calculate how much heat will be produced if a certain mass of matter is annihilated. This idea has been welcomed by the astronomers who have long been hard put to it to devise means of keeping up the furnace fires of the sun as long as mankind would like to live. They have now figured out by Einstein's formula that the sun is losing weight through the destruction of its material and the emission of immaterial energy of the rate of four million tons a second. But even though wasting away at this appalling rate the sun can hold out for ten million million years. This gives a welcome extension of time for the life of our world and permits us to hope that we may get our social system perfected before we all become Eskimos.

This principle of the interchangeability of matter and energy must apply to all chemical reactions where heat is produced or absorbed. Wherever coal burns there matter is being converted into radiant energy. Wherever a green leaf grows there matter is being manufactured out of solar energy. In such cases of course the quantity of matter or energy transmuted is too small to be demonstrated. In the burning of coal the heat evolved means a loss of about one part in ten billion of the joint mass of the carbon and oxygen combined. But this loss of matter becomes appreciable when we consider the world-wide consumption of coal. If we assume that all coal is pure carbon and that the combustion is always complete, the carbon dioxide produced by all the coal that burned in a year throughout the world would weigh about five billion tons. This would involve a disappearance of matter amounting to half a ton. The substance of the world is therefore being slowly consumed by the combustion of coal.

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A gallon of water to a goldfish is a good recipe for a fish tank.

About 45,000 Greek athletic fans could be packed into the stadium in which the famous Olympic games were held.

STUDY HELPS FOR SCIENCE CLASSES

These articles will be found to be especially useful in class work

GENERAL SCIENCE

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(This will fit on a 3 x 5 card.)

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News-Letter Features

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PSYCHOLOGY—BIOLOGY

Gorilla Has Calm Disposition

The first real understanding of the mind and personality of a gorilla has been obtained by Dr. Robert M. Yerkes, professor of psychology at Yale University. For six weeks, Congo, a five-year-old mountain gorilla, worked at problems set by Dr. Yerkes. Results of the experiments show that popular ideas about the African mountain gorilla as a fierce and savage beast are no more accurate than would be our ideas about any other creature that we had met only when it was fighting desperately for its life.

Dr. Yerkes states that he never saw this child ape in a rage. Her social relations with him and with other human beings of her acquaintance were entirely agreeable. In tests of the gorilla's ability, Congo was confronted with bananas, sweet potato, and other attractive food which she could get by learning to use a stick or by pulling a rope in a certain way. In these tests she proved slower mentally than the alert and lively chimpanzee, and often she might reasonably have flown into a rage when she failed again and again to master the situation and reach the prize. But the little gorilla would stick at the task, showing patience and judgment far superior to other types of ape that Dr. Yerkes has studied.

The psychologist concludes that, if Congo displays a fair assortment of gorilla emotions and reactions, these apes are placid, rather stoical, and slow to solve certain problems; but they are, perhaps, the most intelligent of the higher apes.

The three commonest ape traits, curiosity, destructiveness, and imitativeness, seem little developed in Congo. She showed surprisingly little interest in objects of her new world, and had no curiosity about sticks or other new things placed within reach, Dr. Yerkes found.

As for imitativeness, Dr. Yerkes writes: "I can truthfully say that I never saw her ape me or any other person.

"If Congo is relatively impulsive, destructive, curious, imitative, she has deceived or misled me amazingly," he adds. "Her behavior has filled my mind with the impression that she is too much aloof from her environment, too little adventurous, or, in the scientific sense, inquiring, to readily and quickly discover solutions of novel problems and adapt

(*Just turn the page*)

HERBERT CLARK HOOVER

Mr. Hoover is Secretary of Commerce of the United States. He will deliver an address before the annual meeting of the Society of the Sigma Xi in Philadelphia on Tuesday evening at 8:15 o'clock.

HEBER DOUST CURTIS

Dr. Curtis will deliver an illustrated lecture on "The Unity of the Universe" in Philadelphia on Thursday afternoon at 4:30. He is one of the best-known of American astronomers, and has been director of the Allegheny Observatory since 1920.

MEDICINE

Disease May Stop Plague

Little rodents that prey on the weaker members of their own species are the principal carriers of plague on the high veldt, the South African Institute for Medical Research has found.

The plague is spread by the cannibalistic habits of the gerbilles, as the animals are called, as well as by fleas,

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CHEMISTRY

Old Silks Made into New

Turn in your old silk stockings or worn-out clothes of that material and have new silk threads made of them. According to the experiments recently carried on by Dr. P. P. von Weimarn, of the Imperial Research Institute, at Osaka, Japan, this is indeed possible. Dr. Weimarn states that filaments actually better in quality than natural silk can be produced from worn-out silk materials or from the waste silk from cocoons or factories.

The process, as tried out experimentally by him, is one of partially dissolving the silk in hot, concentrated, aqueous solutions of any of the easily-soluble neutral salts, and of subsequent partial dehydration. A viscous liquid is produced by the first treatment. This solution is then partially dehydrated at room temperature by the addition of concentrated, aqueous solutions of other easily-soluble salts, or of alcohol solutions. The viscous liquid turns to a jelly state and then to a ropy-plastic state in which it may be drawn into threads. A washing process is usually necessary before threads can be drawn which closely resemble the natural silk in quality. Frequently the threads so spun in these experiments possessed even greater tensile strength than the original threads of natural silk. The other qualities of natural silk, such as elasticity, softness, resistance, satin gloss, were present in the threads so obtained.

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BOTANY

American Oaks in France

The small and scraggly black scrub oak, or bear oak, of barren lands in the northeastern United States is being made use of in France with considerable success to provide brush cover for similar lands used as game preserves on large country estates, according to Dr. David G. Fairchild of the U. S. Department of Agriculture, who has recently returned from a botanical exploration that took him around the world. The species is a dwarf oak, hardly to be dignified by the name of tree, for its usual height is seldom more than nine feet. though specially favored specimens may reach eighteen or twenty. But it grows and seems to do better on stony ground in France than any of the native shrub or small-tree species.

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CHICAGO ILLINOIS

Gorilla Has Calm Disposition

(*Continued from Page* 195)

herself to extraordinary environmental demands. If this be true, one can understand why the gorilla should be a disappearing race, and perhaps also why so little relatively is known about its mental traits, and so little sympathy exists between man and gorilla.

"Just because the chimpanzee is much fuller of curiosity and more imitative than the gorilla, it has, I suspect, outstripped its gigantic fellow-ape in the race for anthropoid supremacy."

The test situations were designed to show the extent of the gorilla's adaptivity and understanding. If a desired object could not be touched would she try to make a tool out of a stick? Or would she another time make use of boxes, piling them up to make a ladder? How long would it take her to learn that a banana in a milk bottle could be had at once by turning the bottle up-side down? Most of the twenty problems were solved eventually by Congo, Dr. Yerkes says, some by random trial and the selection of a profitable line of action, others by observation of the essential features in the situation and immediate adaptation.

Science News-Letter, December 25, 1926

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Edited by C. K. OGDEN

One of the most significant developments in our lives today is that as scientific knowledge advances, educated people are left more and more in ignorance of its achievements. Scientists for the most part write for each other. It is apparently forgotten that many of the greatest scientists from Galileo and Copernicus to Darwin and Huxley wrote largely for the general reader. *The New Science Series*, written by leading scientists, will present the latest scientific trends and discoveries from all parts of the world.

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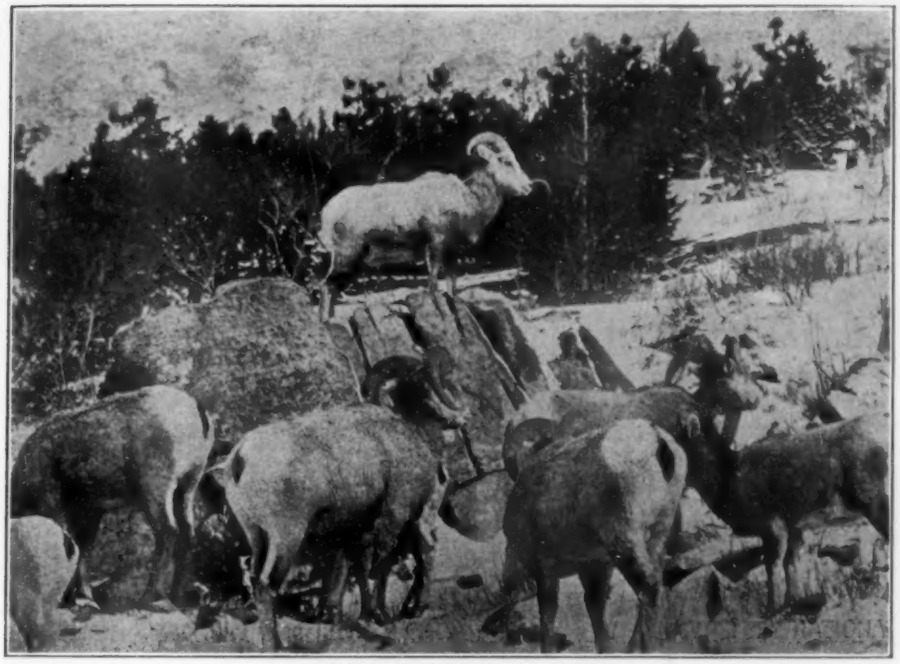

WHEN WINTER COMES

The mountain sheep descend to the valleys and lose much of their shyness.

By Frank Thone

Winter is a time of trial for most menageries. The elephants shiver (and how an elephant can shiver!), the lions bristle their manes with the cold, the giraffes are threatened with sore throat by the yard, and the expensive and sensitive *bandar log* give most disquieting evidence of their kinship to supercilious man by contracting pneumonia and tuberculosis in most human fashion. No, circus owners and zoo curators are not happy persons when winter comes.

Yet the owner of the largest menagerie in the world worries about winter very little indeed. Not for him are expensive animal houses with boiler plants for steam heat and mercury vapor arcs to keep the creatures healthy with their vitamin-forming light. Not for him the big bills for veterinary doctors and their quart-size doses and pills as big as golf balls. Uncle Sam owns thousands of animals where the biggest circuses have mere dozens, and they are scattered over an area almost as large as all Europe, part of which has a winter climate as severe as that of Siberia; and he lets them wander out of doors and shift for themselves, snow or shine. And the vast assorted American Noah's Ark thrives on it and seems to like it.

The secret of it is, of course, that the animals in Uncle Sam's great menagerie are all of them hardy children of the North, who couldn't be coaxed into steam-heated winter quarters even if such existed. Elk and moose, bison and antelope, bighorn sheep and mountain goat, they ask nothing better than to be allowed to range the plains and timber edges, scraping aside the snow with their hoofs for the natural hay underneath or browsing the twigs of bushes and the bark of trees; while others, like the bear and the beaver, sleep securely in their dens or houses until spring shall come again. Their only keepers are the rangers of the National Parks and National Forest Services and the workers of Biological Survey, together with state officers, wherever the herds come under state jurisdiction. The task of these men is mainly to see that the animals are left alone: to run down and capture poachers, and to poison, trap or shoot four-footed beasts of prey.

For the most part the animals are strictly on a self-help basis, and their human friends in the various national and state services keep themselves well in the background.

While the animals of our great national menagerie are scattered over a vast area in the West, from Alaska to Arizona, in national forests, in special game refuges, in the parts of the national domain as yet unappropriated to private ownership, the national parks are in some sense the foci of information and interest about the native big game animals.

Yellowstone National Park, the largest and oldest of the national parks proper, and probably the best stocked with game, may serve as a kind of sample section of our out-of-doors, continental-size zoological park. Park Naturalist E. J. Sawyer reports the stock on hand at the present moment as follows:

Elk (including the Jackson Hole herd)	20,000
Buffalo, "tame" herd, including calves	846
Buffalo, "wild" herd, estimated	125
Pronghorn antelope	400
Mountain sheep	600
Mule-deer	1,850
Moose	575
Black bear	225
Grizzly bear	80

Mountain lions, wolves and coyotes were not counted, for the very good reason that the only way the rangers care to count game-killers is with .30-30 cartridges. Mountain lions and wolves are extinct in Yellowstone Park, and coyotes survive only on tolerance, because they are useful in keeping down the swarming numbers of rodents. Where they make themselves noxious, as for example on the pronghorn antelope range, it becomes a part of the winter job of the ranger force to go out against them with trap and rifle. During the present year 243 of these wild dogs of the plains were sent to join the 180 of their kindred that were killed in 1925.

The game count of Yellowstone Park is a fair sample of what may still be found in the great American West, but the proportions of the various species are not uniform all over the region. For instance, deer are not especially numerous in this park, while in Yosemite they very nearly own the place, their herds totaling about 50,000 specimens. How many deer range the wildernesses outside the national parks and forests no one knows with any accuracy, but there must be many thousands. In some places they become very serious problems, for they become quite fearless of man during the closed seasons, and leap the fences of the ranches to work havoc on stored hay and other feed.

(Just turn the page)

Greatest Menagerie

(*Continued from Page* 197)

On the other hand, the moose of the Yellowstone region, though less numerous than the deer, are practically unique. None of the other national parks has any at all, and the only national forests in which they range are those immediately adjacent to Yellowstone Park. These Yellowstone moose are rated by some naturalists as a species quite distinct from the great animals of the Canadian woods and northern New York and Maine.

As shy as the moose, but often seen nevertheless, is the pronghorn-antelope. This is because the pronghorn is naturally a creature of the open plains, instead of a denizen of the deep forests, as is the moose. The pronghorn is the one antelope-like animal that is native to America. The 400 specimens in Yellowstone are only a small sample of the herds that roam the state of Wyoming alone, totaling some 7,000. There are other large herds in other states of the West, and according to Dr. Edward W. Nelson, chief of the U. S. Biological Survey, the total number in the country now amounts to something like 30,000. Yet these are only a remnant of the innumerable host that once ranged from western Iowa almost to the Pacific. Fortunately, strict closed seasons have been made permanent in practically all of the western states, and with the reduction of the numbers of their natural enemies the antelope are coming back.

The pronghorn's lumbering companion of the old plains days, the bison or American buffalo, fared even more hardly than did the little antelope. Except for the tiny isolated herd of about 125 animals on an out-of-the-way part of the Yellowstone Park plateau, there are probably no bison left in unfettered freedom on unfenced range in the United States.

In the United States, at least, the bison herds have to be nursed along as though they were domestic range cattle. In Yellowstone Park there is a large fenced range for them, and within it a fenced-off farm where hay is raised in large quantities. The bison feed on natural pasture until the winter drives them down from the hills, and then the buffalo keeper and his assistants supply them with hay. The summer of 1926 was drier than normal in the Yellowstone country, and the natural forage crop was therefore short. Fortunately, the hay crop, raised partly under irrigation, was fully up to normal, and the winter so far has been comparatively mild, so that unless something untoward develops, there will be no abnormal hardship among the bison there this winter.

The fare of the bison is shared by the elk and the antelope, as well as by the deer, mountain sheep, and other game animals. Indeed, in some places, as in the Teton National Forest, the Biological Survey supplies hay for the exclusive benefit of the elk. This feeding of hay is recognized, however, as at best a makeshift. What National Park Service officials are asking Congress for is a restoration of part of the original natural ranges of these animals, which have in some places been restricted by grazing permits. Money is on hand from private donations, in some instances, to repurchase these permits and return them to the government if the range is given to the game animals. It is to this end, partly, that the extensions of several of the national parks are being advocated.

PHOTOSYNTHESIS

By H. A. SPOEHR

Laboratory for Plant Physiology, Carnegie Institution of Washington

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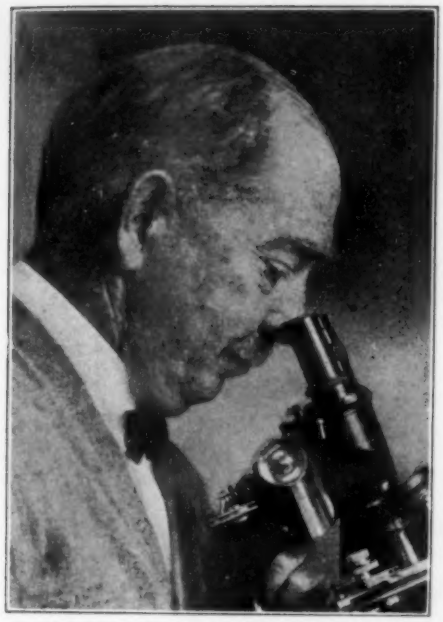

CLARENCE ERWIN McCLUNG

Prof. McClung is chairman of the local committee on arrangements. He holds the post of professor of zoology and director of the laboratory at the University of Pennsylvania, and is a trustee of the marine biological station at Woods Hole.

GEOLOGY—CHEMISTRY

Helium Found in Ontario

A widening of the field of production of helium gas to include the Canadian province of Ontario has been recently announced. The Ontario government claims that a deposit of helium gas has been discovered at Inglewood, about forty miles from Toronto. Three wells have been taken over by the government and are being worked. Commercial development of helium gas on a large scale is expected to result in time. The discovery was made during the war but was kept a secret until recently, when the wells were taken over by the government.

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ARCHÆOLOGY

Korean Beetle Decoration

A beetle that furnishes the principle decorative motif in a famous shrine in Japan has been identified as being the same insect as that figured on certain royal relics recently unearthed from a tomb in Korea.

Prof. Hachiro Yuasa of Kyoto Imperial University told the Pan Pacific Science Congress meeting at Tokyo that the distribution of the "jewel beetle" and the identity of the materials used in representing it are important evidence of the distribution of a common culture between ancient Japan and Korea.

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HEREDITY

Lungs and Marriage

The cautious young woman of the future will insist upon looking up the family history of her prospective husband, not to ascertain whether he can trace his lineage to the *Mayflower*, but to learn whether there is in his family a constitutional tendency to weakness of the respiratory system or other organs.

So eugenists claim, and their position finds support in a study to be published in the forthcoming number of the *Annals of Eugenics*, London, by Dr. Raymond Pearl, of the Institute for Biological Research, Johns Hopkins University.

The subject of the study is a family of thirteen brothers and sisters, all of whom had pneumonia one or more times before reaching the age of 19. Seven of the 13 died of it. One of the survivors had tuberculosis of the lungs and another presents clinical symptoms which make it probable that he also has.

A study of the records of 202 blood relatives of these thirteen children, in five generations, showed that 6.25 per cent of those examined on the father's side had tuberculosis, while on the mother's side 3.9 per cent had respiratory trouble in infancy and 3.2 per cent in childhood.

The evidence carefully collected and tabulated shows in the father's kinship, according to Dr. Pearl, a definite tendency toward constitutional inferiority of the respiratory system which manifested itself chiefly in a tendency to break down from pulmonary tuberculosis in early adult life, and in the mother's kinship a tendency to generally non-fatal respiratory infections, bronchitis and broncho-pneumonia, in infancy and childhood.

The union of these two constitutional traits through the mating of the father and mother produced in these children, according to Dr. Pearl, an extremely low resistance to any sort of respiratory infection.

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A motor plow that can be worked within six inches of vegetable rows or fences has been invented.

Recent tests of the mentality of a young gorilla revealed that the animal was decidedly right-handed, like most humans.

It required seven seconds longer for a British aviator to climb 1,500 feet with a wooden propeller than with a metal propeller.

BURTON EDWARD LIVINGSTON

Prof. Livingston has been permanent secretary of the American Association for the Advancement of Science since 1920. He is professor of plant physiology at the Johns Hopkins University, and has invented a number of devices for the study of plant environmental conditions.

A. A. A. S. MEETING

Science Radio Talks

In cooperation with the American Association for the Advancement of Science, SCIENCE SERVICE has arranged for a series of five radio talks on Science to be given during the Christmas meeting in Philadelphia. These will be given from Station WOO, the Wanamaker Store, and WIP, Gimbel Brothers, as follows:

Monday, December 27: 7:45 to 8:00 P. M.; Station WOO—"What Science Means to Humanity," Dr. Vernon Kellogg, Permanent Secretary, National Research Council, Washington.

Tuesday, December 28; 8:40 to 8:50 P. M.; Station WIP—"Artificial Light and Civilization," Dr. M. Luckiesh, Director Nela Laboratories, Cleveland, Ohio.

Wednesday, December 29; 7:55 to 8:10 P. M.; Station WOO—Address by Prof. Michael I. Pupin, Columbia University, New York, retiring president of the Association.

Thursday, December 30; 8:35 to 8:45 P. M.; Station WIP—"Why Plants Need Water," Prof. Burton E. Livingston, Johns Hopkins University, Baltimore, Md.

Friday, December 31; 7:55 to 8:10 P. M.; Station WOO—"Science News from the Association Meeting," Dr. Edwin E. Slosson, Director, Science Service, Washington, D. C.

Science News-Letter, December 25, 1926

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Science Service and E. W. Scripps' Philosophy of Life

The following are extracts from an address by Dr. William E. Ritter, president of Science Service, entitled "Science Service as One Expression of E. W. Scripps's Philosophy of Life." The late E. W. Scripps, founder of the large group of American newspapers that now are known as the Scripps-Howard newspapers, endowed Science Service as an institution for the popularization of science operating in part as a newspaper syndicate.

It would be useless to try to evaluate E. W. Scripps' belief in Science Service without trying to understand his philosophy. With this, as with every other major thing he did, if but twelve words could be devoted to it, at least six of them would have to be devoted to the philosophy behind it to assure the effort of any success. Again it would be useless to try to understand his philosophy apart from his personality.

Objectively realistic to the very root-tips of his nature, his attempts at self-analysis brought out conclusions that were striking, to say the least. Trying to appraise the factors that contributed to his journalistic and business success, he put down in one of our very last talks his ability "to holler louder than anybody else" as probably one of the specially potent factors; and from what I had seen of his methods in years past I could accept his appraisal.

It is useless, Mr. Scripps often said, to think of making the world safe for democracy without thinking also of making democracy safe for itself; and the only possible way of making democracy thus safe is to make it more intelligent. But since to be intelligent is utterly impossible without having much of the knowledge, the method, and the spirit of science, the only way to make democracy safe is to make it more scientific. But the real import of this view of his can be seen only by seeing what being "scientific" meant to him.

Unquestionably his psychobiological type was humanistic and esthetic rather than physical and mechanistic. The most serious part of his formal education was under the guidance of his sister Ellen, and consisted largely in reading, predominantly of history and literature, in which poetry had a large place. Formal science had but little chance in his program of early education. The way he had of counting everything fish that got into his net is well illustrated by the on-coming of his interest in science during the late period.

He contended that his later excursions into science and philosophy had on the whole made more objectively real the cardinal principles which had guided his entire business and journalistic career, and hence had redoubled his determination to stick to those principles regardless of how strongly business interests might seem to require a different course.

E. W. Scripps

Since, he said, he had recognized from the outset of his career, that all business, journalistic business in special measure, has no foundation whatever apart from human welfare, his perception that science too is basically thus founded had augmented the firmness of his life-long business convictions to such an extent as to move him to do all in his power toward bringing science and the business of journalism into organic cooperation.

To indicate as briefly and cogently as possible the journalistic and business principles which had guided his career and which he held to be confirmed and extended by what he later learned from science, it is necessary to go back almost to his entrance into journalism, when he was well night experienceless, reputationless and moneyless. That was the time of his founding, in 1878, of the Cleveland Penny Press, the first penny paper in the United States, on ten thousand dollars made available to him by other members of the Scripps family. The sum and substance of the principles then adopted and the policies acted upon was simplicity itself so far as statement is concerned: Get the truth just as far as possible; write the essence of it so simply and clearly that anybody who can read it at all can understand it; and publish it so cheaply that anybody who has any money at all can afford to buy the narration.

Alongside this early statement of newspaper ideal or purpose should be put the following written earlier in 1919, when the idea which resulted finally in Science Service was taking form in his mind: "Every thorough scientific man who is in the habit of reading the daily newspapers is constantly reminded that there is a vast quantity of misinformation being constantly spread abroad by our newspapers."

Thus comes to clear light the large area of common ground, as he saw it, between the functions of the newspaper and of science in the community: To discover the truth about all sorts of things of human concern, and to report it truthfully and in language comprehensible to those whose welfare is involved. That the paraphernalia — methods and worker—preparation in the two fields must be very different he fully recognized, though the differences did not blind him to what is common between them.

The sketch of the man I have so far presented shows him as hardly more than a dabbler in the natural sciences. But in his relation to the humanistic sciences of economics and finance, he was a student in the truest sense of the word. He worked hard at them in their historic and theoretic aspects, and, what is of far greater importance, in their practical aspects. The volumes of his disquisitions on these subjects will, it seems safe to predict, when published and studied in connection with the organizations he built up, prove of great value to the world. Human welfare was the pole-star of all his thought and effort in these as in all else that seriously engaged him, though such welfare included his own welfare and was not something set over against his own under the illusion of an abstract altruism.

Mr. Scripps believed he had discovered late in his journalistic ca-

(*Just turn the page*)

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E. W. Scripps

(*Continued from Page* 201)

reer what was needed to make more real, more effective, the ideas and ideals he had made his own early in that career. I believe we should look upon Science Service as embodying his idea and purpose to draft scientists into the task of doing their necessary part, along with journalists, toward making journalism what he had always conceived it ought to be, a great agency for promoting human welfare through education, conducted on a self-supporting basis. His purpose fully realized would enroll journalism as an applied science in the group of humanistic sciences.

Looked at in a little more detail, his discovery was that journalism might have in its foundation much of the attitude and method of science and might utilize to its own advantage much of the results of scientific research. One thing that had a strong place in the back of his mind when he founded Science Service was, I am quite sure, the mobilization of science in the interests quite as well of the journalistic profession as in that of the general public. He wanted to create an agency which, because of its complete organic independence of his own and all other newspapers, would make it possible for scientific men the more effectually to utilize the newspapers for making actual their great latent powers of good for the public at large. In the earliest statement of his ideas we have, written apparently before he had consulted any scientist, he said: "The object of this institution * * * should be to make the greatest use possible of the press in the way of disseminating that knowledge which is the result of painstaking research carried on by a few hundred, or at most a few thousand, well-trained men equipped with great mental capacity."

Viewing the matter thus, the institution is seen to be just as intrinsically an element for making effective his journalistic philosophy as were any of his newspapers or as was the Newspaper Enterprise Association or the United Press. To him the daily newspaper was as truly an educational agency as the school. He held with the strongest convictions that it has some great advantages over the school, the chief of which is that it comes into closer relations with the actual life of the community than it is possible for the school to come; and that in virtue of such relations it is able, as the school is not, to be economically self-sustaining. That it is possible for the newspaper to perform its service to the community, not only without support from public taxation or private benefaction, but with actual financial profit, seemed to him of great importance in that it requires the teacher through it to have relation to life and business which the school teacher can not have. But the evidence is conclusive that he never lost sight of the fact that the real basis of the newspaper's ability to earn profits is its ability to render service. He felt keenly the danger newspaper management is in of becoming oblivious to the real basis of its possibilities of business success. The outspoken declaration of some newspaper men that financial profit is the real goal of this as of any purely commercial business he regarded with as much horror as would a physician or lawyer or teacher or preacher who should make such a declaration about his calling.

Science News-Letter, December 25, 1926

Dr. Ritter's address on E. W. Scripps is printed in pamphlet form and copies of it will be sent gratis to subscribers of the Science News-Letter upon request.

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WILLIAM JACKSON HUMPHREYS

Dr. Humphreys is general secretary of the American Association for the Advancement of Science. As professor of meteorological physics of the U. S. Weather Bureau, he is recognized as an authority in both physics and the science of the weather.

BOTANY

X-Rays Hurtful to Plants

X-rays can have harmful effects on plants as easily as they can on animals, and the result of an apparently mild dose given to a plant in its youth may show up in distortions and freak growths much later, when maturity has been reached. A series of experiments with X-rays on plants, conducted by Edna Louise Johnson, of the University of Colorado, is reported in the *Botanical Gazette*.

Miss Johnson used sunflowers for her material, raying them while they were young seedlings and even unplanted seeds. Then she let them grow up and watched for results. Most of the plants developed fasciated stems, a phenomenon occasionally observed in nature, caused by injury to the growing tip. The doubling tendency extended to leaves and flowers as well, for many leaves had two blades and some of the flower heads appeared in distorted and unnatural shapes.

The effects of the X-rays were evident internally as well as externally. The stem was made coarser and woodier, its water-conducting vessels were dislocated from their usual positions, and abnormal amounts of corky material appeared in the skin.

PHYSIOLOGY

Color Affects Reproduction

Different colors of light have varying effects on the rate of reproduction in several of the algæ and of the simple forms of life that lie in the biological borderland between plants and animals.

Dr. A. Brooker Klugh of Queen's University has found that two one-celled forms of life knows as *Volvox aureus* and *Closterium acerosum* reproduce most rapidly in red light. Experiments with two other species gave similar results.

Three boxes were constructed, each having the front open and a light-tight door behind. Into each of these boxes a vial containing five of these individuals or colonies was placed. Over the front of the boxes a color filter was fixed in such a way that the colors of the spectrum were divided into three portions, red, blue and green. The filters were so prepared that the light reaching the organisms was of the same intensity in all cases. They were exposed to sunlight for two hours daily, under carefully controlled conditions. Within a short time the *Volvox* colonies had increased from five to 35 under the red light, all under the green had died, and the blue allowed an increase to 16. Eleven days later there were 56 in the box under the red light, and all but three under the blue had died.

Under identical conditions *Closterium acerosum* gave parallel results. Dr. Klugh points out that, though these experiments give some indications regarding photosynthesis, to take these rates of reproduction as a criterion of the efficiency of light wave lengths in photosynthetic activity would not be wholly justified, because other factors are involved in the reproduction rate.

ARCHAEOLOGY

Chinese Porcelain Treasure

What is probably the greatest collection of Chinese porcelains in the world has lain hidden in the cellars of the treasure house of the "old serai" of the Turkish Sultans in Constantinople, according to Prof. Ernst Zimmermann of Dresden, one of the world's foremost authorities on ceramics. A large part of the collection consists of Sung and Ming pieces, ranging in date from the tenth to the seventeenth Christian centuries. It is believed that the bulk of the art treasure was gathered by Sultan Soliman the Magnificent, during the middle part of the sixteenth century.

BIOLOGY

NATURE RAMBLINGS

By FRANK THONE

Holly and Mistletoe

Christmas and holly are so inseparable in the tradition of western Christendom that people who live where holly does not grow are willing to send long distances for their wreaths and garlands of the bright-berried branches.

It is only natural that this should be so. Our ancesters in the forests of northwestern Europe had a mid-winter festival celebrating the passing of the longest nights and the beginning of the return of the sun, long before Christ vanquished Odin and took away his feasts along with his worship. Winter, when the merriest birds fled, when leaves and flowers and fruits were gone from the trees, was a time of hardship and anxiety, and any green thing was treasured for its memory of good days gone and its promise of better days to come. Hence, the German folk-song "O Tannenbaum" to the hemlock; hence the use of ground-pine and wintergreen and all the little creeping verdant things; hence the use of holly.

The modern commercial exploitation of our holly resources has wrought havoc with the holly shrubs and trees in the more accessible regions, and the cultivation of holly is now seriously undertaken by horticulturists. It is a difficult plant to grow from seeds or cuttings, but recent scientific work has done much to overcome this trouble, and now any family that wishes can have its own holly tree in the back yard or even growing in a tub to bring indoors at Yuletide.

One cannot think of holly without calling to mind the mistletoe. Though the fate of the other plants that make up our Christmas greens is a source of anxiety to conservationists, nobody worries about the mistletoe. In spite of its romantic associations, it is a destructive parasite and as such is harmful to timber. Down South where most of our supply comes from, men knock clumps of it out of the trees with heavy charges of buckshot!

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First Glances at New Books

THE ESCAPE FROM THE PRIMITIVE—Horace Carncross—*Scribner's*. ($2.50). Highly speculative and occasionally questionable discussions of the world at large and human beings in particular by a psychoanalyst.

Science News-Letter, December 25, 1926.

FROM MYTH TO REASON—Woodbridge Riley—*Appleton*. ($2.50). Few men would have been so competent to tell the story of the growth of the scientific method for the six thousand years of history, and, of that few, much fewer would be able or willing to tell it so simply and clearly. Without pedantry or parade of learning, without heat or intolerance, he describes the early gropings after truth in Egyptian and Babylonian legend, the rise of rationalism in Greece, the long eclipse of the Dark Ages, the struggles of astronomy to free itself from the shackles of astrology, the materialism of the eighteenth century, and the evolution of evolution. The narrative is enlivened by bits of biography and curiosities of thought. It is more than a history, for Professor Riley has taken pains to state the opposing arguments in the historic conflicts of thought. For these reasons it is particularly adapted as a beginner's book whether the beginner be young or old.

Science News-Letter, December 25, 1926

THEORY OF VIBRATING SYSTEMS AND SOUND—Irving B. Crandall—*Van Nostrand* ($5). An advanced technical treatment by a Bell Telephone Laboratories expert. The data given are fundamental to the telephone, radio, auditoriums, phonographs, loud-speakers, and anything else that has to do with speech, music or other sound.

Science News-Letter, December 25, 1926.

PLANKTON OF THE OFFSHORE WATERS OF THE GULF OF MAINE—Henry B. Bigelow—*U. S. Department of Commerce: Bureau of Fisheries Document No.* 968. An exhaustive quantitative technical study, of value to the Atlantic fisheries industries.

Science News-Letter, December 25, 1926.

EDUCATIONAL OPPORTUNITIES FOR YOUNG WORKERS—Owen D. Evans—*Macmillan* ($3). The first of the studies of methods of adult education sponsored by the Carnegie Corporation of New York. It tells what opportunities for future education there are or should be for the great army of grammar school graduates.

Science News-Letter, December 25, 1926

ENTOMOLOGY

The Way of a Butterfly

Quotation from HOW INSECTS LIVE. W. H. Wellhouse. Macmillan.

The commonest butterfly seen in most parts of the country is a white one which flies over the fields and gardens, usually not higher than our heads. It flies apparently aimlessly, stopping frequently for a moment to rest on some low plant, then going in a new direction. In all probability its flight is not so aimless as it seems and it is seeking plants belonging to the *Cruciferae* family such as cabbage, rape, turnip, mustard, nasturtium, cauliflower, horse-radish, radish, kale, etc. It is upon the leaves of these plants that the larvæ live, so the butterfly must place the eggs there. How she can distinguish the plants of this family we do not know, but if a bit of the oil extracted from mustard plants be placed on other plants it will attract her, so it seems probable that a keen sense of smell guides her to the proper plants. She spends much time in locating places for her young to live. She is not content to deposit her eggs in large groups all in one place as many butterflies do, but instead she deposits a single egg in each place and thus her young may occur in 200 or more different locations. An enemy must therefore look far and wide to find them, and some of them will surely survive.

Science News-Letter, December 25, 1926.

GEOLOGY

Niagara's Suicide

Quotation from WHAT PRICE PROGRESS? By Hugh Farrell. New York: Putnam's. $2.50.

If you are one of those who prefer the roar of tumbling waters, wasting themselves away to the sea, to the roar of wheels, turning in the service of man, it may interest you to know that Niagara Falls, as Mr. Harper once said, is committing suicide. Yes, that's what it is doing. Inch by inch, foot by foot, mile by mile, Horse Shoe Falls on the Canadian side is cutting back into the escarpment and little by little destroying the beauty of that once most gorgeous spectacle. I said little by little, but it is not little by little—the self-destroying erosion which Horse Shoe Falls is carrying on is proceeding at the rate of more than 6 feet a year. The symmetry of the toe of the shoe has already been destroyed, and the concentration of flow that increases with every inch of erosion is rapidly cutting a wide gash straight back. This gash is drawing the water away from the two sides of the heel of the falls, leaving them bare and ugly.

Science News-Letter, December 25, 1926

GEOGRAPHY

Homeric Cosmogony

Quotation from A STUDY OF THE OCEANS. James Johnstone. Longmans, Green. ($3.75)

Thales of Miletus (about 600 B. C.) gives us a conception of the world which is entirely different from that of Homer and Hesiod. The earth itself is now a sphere unsupported in space. That it was a sphere Thales deduced from the appearance of the earth's shadow seen on the moon during eclipses. He is said even to have predicted the occurrence of eclipses, using the true theory. He made the Zodiac, or path of the sun through the star-constellations, and he made a celestial meridian at right angles to the Zodiac. This advance in nature-knowledge, beyond the shadowy, legendary references which we find in Homer and Hesiod, is so enormous that we simply must refer the cosmogony of the poets to materials of a much earlier period than only three centuries before Thales.

It is remarkable that the geography of the seventh to the third centuries of the pre-Christian era is as different as it can be from that of the Iliad and the Odyssey. The date of composition of these great poems is usually taken to be about 1000 B.C., but so enormous an advance in natural knowledge is apparent in the speculations of the seventh century that we must conclude that the Homeric cosmogony is really that of a much earlier date than the tenth century B.C.

Science News-Letter, December 25, 1926

A Star Map

All of heaven in my hands—
With one finger I can turn
Till I sink Orion's bands,
And the Lyre begins to burn.

I can make a night of spring,
Shivering Spica, white Altair,
And above me I can swing
Slowly Berenice's Hair.

Winter evening, autumn dawn
Man has charted; I can see
How Midsummer Night moves on
Tranquilly and terribly;

Light lost in light, death lost in death,
Time without end, Space without bound—
I, whose life is but a breath,
Turn Infinity around.

—Sara Teasdale in *The Bookman*.

Science News-Letter, December 25, 1926

A three wheel auto recently won a six-day motor race in Scotland.

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Anniversaries of Science

December 28, 1870.—The "flash spectrum" of the reversing layer of the sun was caught by Prof. C. A. Young during an eclipse at Xerez de la Frontera, Spain.

The eclipse of December 28, 1870 . . . is memorable for the discovery by Young of the "reversing layer" of the solar atmosphere. This term is now applied to a shallow stratum resting immediately upon the photosphere, the absorption of which produces the principal dark lines of the solar spectrum, but which, being incandescent, gives a spectrum of bright lines by its own light when the light of the sun is cut off. This layer is much thinner than the chromosphere, and may be considered to form the base of the latter. Owing to its thinness, the phenomenon of the reversed bright lines is almost instantaneous in its nature.

—Simon Newcomb: *Eclipse* in Enc. Brit.

December 30, 1691.—Robert Boyle, the chemist, died.

I must not look upon any body as a true principle or element, but as yet compounded, which is not perfectly homogeneous, but is further resoluble into any number of distinct substances, how small soever . . . I mean by elements, as those chymists that speak plainest do by their principles, certain primitive and simple, or perfectly unmingled bodies; which not being made of any other bodies, or of one another, are the ingredients of which all those called perfectly mixt bodies are immediately compounded, and into which they are ultimately resolved.

—Boyle: *Sceptical Chymist.*

December 31, 1844.—Manilla dropped one day from its calendar to rectify a mistake made in the 16th century.

To the first circumnavigators the necessity of altering their day on passing the meridian of 180° was unknown, and so it came about that—the error persisting until quite recent times—Hong-Kong and Manilla called the same day Monday and Sunday.

—Guillemard: *Life of Ferdinand Magellan.*

January 1, 1801.—Guiseppe Piazzi discovered Ceres, first known of the asteroids.

Between the orbits of Mars and Jupiter lies a large gap of space, in which, according to Bode's law, should lie a planet 2.8 times as far from the sun as our earth. Beginning about the year 1800, astronomers have been filling this gap with little planets, none of them nearly as big as our moon, and ranging from a diameter of 500 miles down to, comparatively speaking, mere rocks of but a few miles in size. In all, nearly a thousand have already been discovered, and it seems probable that if we could detect every one, however small, the number would be almost countless.

—Abbot: *The Earth and the Stars.*

SAMUEL W. FERNBERGER

Dr. Fernberger is secretary of the local committee of the Philadelphia A. A. A. S. meeting. He is assistant professor of psychology at the University of Pennsylvania.

GEOLOGY

Shovel Digs Out Sharks

More fossil fishes and sharks are being turned out in a day by a power shovel operating in the region to the west of Cleveland, Ohio, known to geologists as the Big Creek basin, than the patience of old time collectors would bring to light in a whole season. Since lots are being laid out in this section of Cleveland shale prized by scientists for its fishy relics of a past age, the Cleveland Museum of Natural History has obtained the cooperation of one of the land companies and funds from friends to manipulate a steam shovel. Though Big Creek is only one foot deep, sharks five feet long are caught by the shovel while the bungalows creep closer every day. Many choice fishes, millions of years old, are being saved to science that would otherwise be lost, according to Dr. J. E. Hyde, curator of geology of the Cleveland Museum.

Science News-Letter, December 25, 1926.

BIOLOGY

Evolution Fight in Carolina

The evolution issue, thought dead in North Carolina, threatens to crop up again at the coming session of the legislature. A fundamentalist committee has a bill in preparation, which they state they will introduce early in January.

PSYCHOLOGY

Child Intelligence

A quick method of rating intelligence by means of the crude, angular, moon-faced "men" that all children like to draw has been evolved by Dr. Florence L. Goodenough, of the Institute of Child Welfare at the University of Minnesota.

Dr. Goodenough collected 4,000 imaginary drawings of men made by children from four to eleven years old. The men ranged from cubistic scrawls by the youngest and least intelligent children up to portraits of considerable realism with such details as five fingers, buttoned shoes, eyelashes and moustache. The drawings were rated according to the proportions of the human figure and the amount of detail shown.

The girls tended to range slightly higher in intelligence than the boys, by this test, Dr. Goodenough found. She suggests as a possible explanation that a child who perseveres in the face of difficulties and who gives careful attention to details is likely to make a higher score on the drawing test than another child who has equal ability but lacks these particular characteristics.

"It is possible that a slight superiority of girls over boys in traits such as these may account both for their more rapid progress in school and their higher average on the drawing test," she states.

Because the test does not require a verbal explanation in order that the children may understand what they are to do, it is considered particularly suitable for investigating the mentality of deaf children and children from foreign homes.

Science News-Letter, December 25, 1926.

ZOOLOGY

Spiders in Snows

Tiny spiders, the highest-up animals on earth, living 4,000 feet above any vegetation on the Himalayan slopes, are some of the survivals of the fittest described by Major R. W. G. Hingham, naturalist to the Mt. Everest expedition, in the Annual Report of the Smithsonian Institution for 1925 just published.

The minute creatures were found on islands of broken rock surrounded by snow and ice with no sign of life around them so that for food they must eat each other, said Major Hingham.

Science News-Letter, December 25, 1926.

Fruit dealers are using heated cases in which to display bananas.

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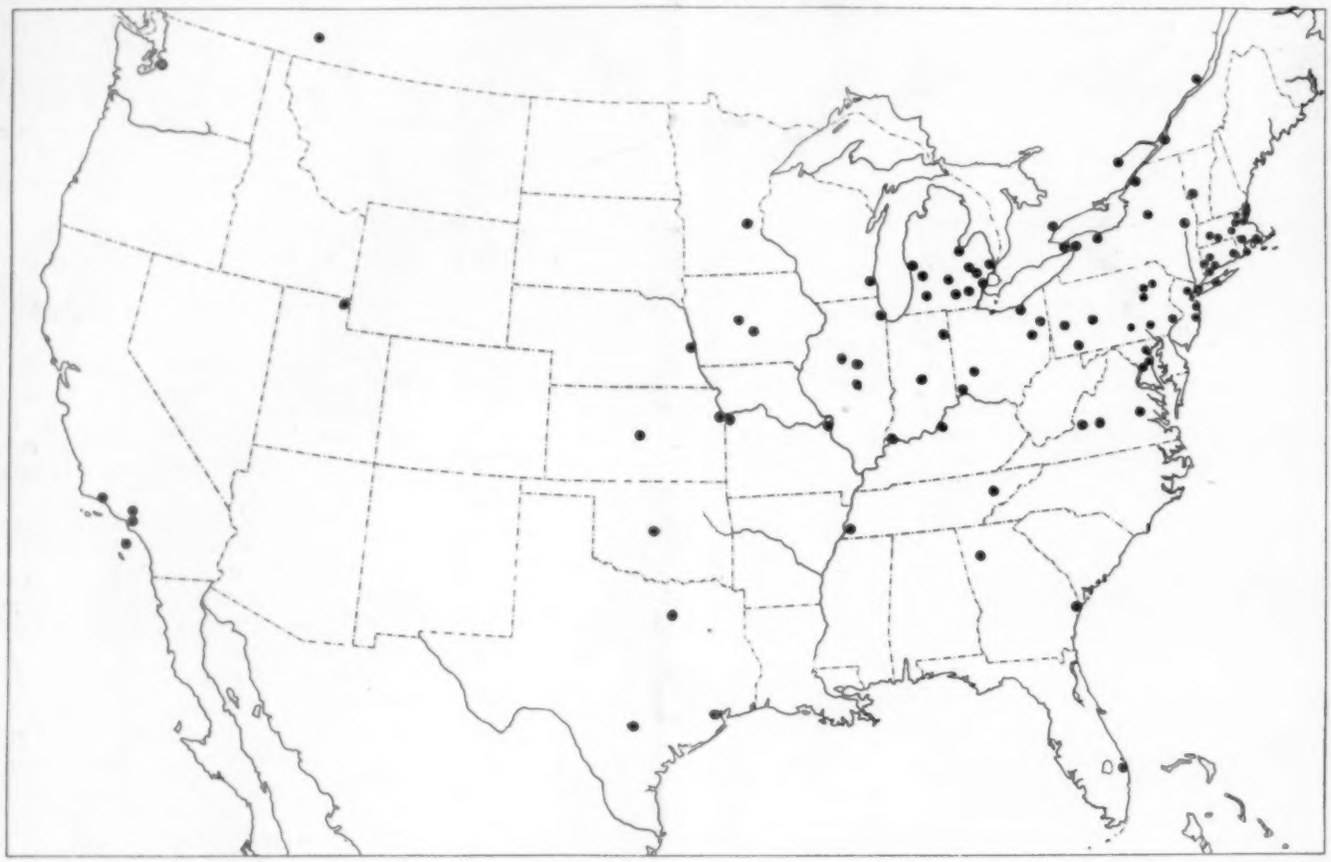

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